Center Innovation Fund: GSFC CIF

Graphene-GaN Schottky Photodiodes

Completed Technology Project (2011 - 2013)

Project Introduction

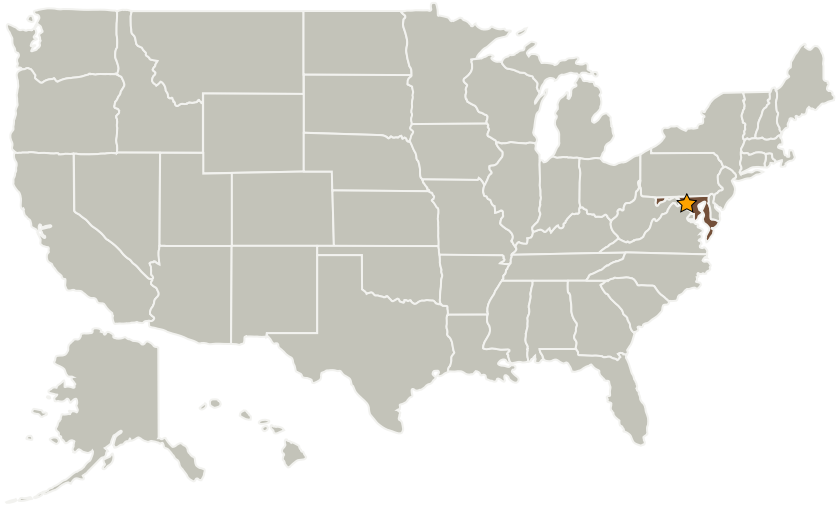
Graphene-GaN Schottky Photodiodes is the development of the world's first graphene-based GaN Schottky device that has the potential to achieve a much greater total quantum efficiency in UV. The objective of this project is to characterize the Schottky barrier height for graphene and the total quantum efficiency (QE) of the graphene-GaN Schottky diodes.

Integration of graphene as the top metal on GaN Schottky. This will replace platinum, which is 50% transparent at the desired wavelength, with graphene, which has higher mobility and much higher transparency (>90%). Develop a fabrication process for GaN Schottky and a chemical vapor deposition process for large area graphene. Develop a process to cleanly integrate single or multilayer graphene on GaN devices and pattern them. Develop a characterization scheme to determine the Schottky barrier height of graphene and device QE.

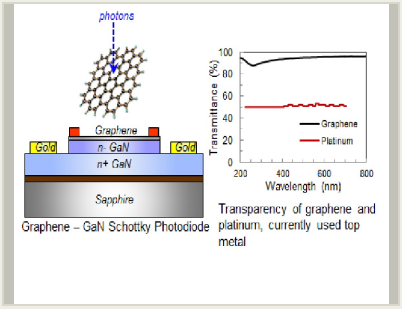
Anticipated Benefits

N/A

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland



Project Image 236 CC CIF * Graphene-GaN Schottky Photodiodes

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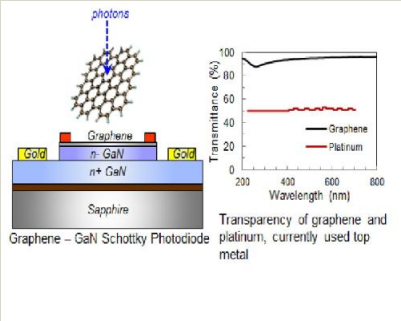
Primary U.S. Work Locations

Maryland

Images



51.jpg
Project Image 236 CC CIF * Graphene-GaN Schottky Photodiodes
(https://techport.nasa.gov/image/1276)

Links

NTR 1
(no url provided)

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Innovation Fund: GSFC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Peter M Hughes

Project Manager:

Theodore D Swanson

Principal Investigator:

Mahmooda Sultana

Co-Investigators:

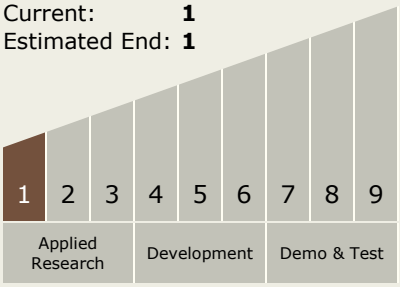
Mary J Li
George Manos
Shahid Aslam

Graphene-GaN Schottky Photodiodes

Completed Technology Project (2011 - 2013)

Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **1**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes